

# NASA TECH BRIEF



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## Frequency Domain Analysis and Synthesis of Lumped Parameter Systems Using Nonlinear Least Squares Techniques

A generalized technique for the design and analysis of linear systems in the frequency domain has been developed that greatly improves the design procedure for filter and compensation circuits. The evaluation of lumped parametric system models has been found to be simplified and computationally advantageous in the frequency domain.

The numerical Fourier transformation equations involved in the frequency domain model are ideally suited for computer calculations. A nonlinear least squares computer program has been developed which finds the least square best estimate for any number of parameters in an arbitrarily complicated model.

Additional advantages of frequency domain modeling include: the facility with which analytical frequency solutions can be obtained as compared with time solutions; there is no change in the form of the frequency solution as the values of the parameters

are changed; the limits of the integral of the squared error can be set to include only the region of interest.

### **Note:**

No further documentation is available. Inquiries may be directed to:

Technology Utilization Officer  
Marshall Space Flight Center  
Huntsville, Alabama 35812  
Reference: B69-10577

### **Patent status:**

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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